

Request for Economic Stimulus Funds

Concept Proposal

Submitters (Name of Workgroup & Chair/Co-Chairs):

Technology and Networking – Al Lind, Chair

Regional Optical Network Writing Team - Susan Lancaster, Co-Team Captain, Al Lind, Co-Team Captain

Project Title:

Kentucky Regional Optical Network – Connecting the Middle Mile

Project Partners (Known or Anticipated):

KyRON, University of Kentucky, University of Louisville, CPE, COT, Windstream, AT&T, KCTCS, AIKCU, Kentucky universities and colleges, KDLA, Education Cabinet, KDE

Project Background & Purpose (Justification for Project):

Kentucky is fortunate that due to some highly innovative and collaborative work, the education community and COT have established some well designed if under powered networks. In 2004 postsecondary implemented an MPLS network, KPEN, for public postsecondary institutions. In 2005 COT did likewise for state agencies. In 2006 the Kentucky legislature funded the KEN network which added K12 as an MPLS network and connected the three networks together. In 2007 Internet2 established an Optical Switching Node in Louisville and the Kentucky regional Optical Network (KyRON) was created with a 10 Gbps fiber link connecting two hub sites in Louisville and Lexington. KyRON connects UK and UofL to each other, to Internet2 and to the KPEN. K12 and state agencies are also allowed access to Internet2. A small but highly effective effort called the Internet2 Initiative has helped increase awareness among postsecondary faculty and K12 teachers about the rich education materials and capabilities greater bandwidth allows. For example, MegaDEAFConference 2009 was hosted by the Kentucky School for the Deaf which connected to over 40 sites in eighteen states, England, Ireland and Canada. There is a growth plan for additional bandwidth but no funds for implementation. Stimulus funds provide a once in a lifetime opportunity to create a strategically planned statewide network that includes all of Kentucky's needs.

With the increasing trend toward outsourcing, centralization and cloud computing the wide area middle mile network is more and more becoming what the campus local area network has been in the past. The need for robust speeds and rock solid reliability are critical for an array of enterprise applications. This middle mile effort is complementary to three other related concept papers on Rural Communities, Sustainable Adoption and Public Internet Access. The middle mile efforts will allow the Telcos to build out advanced technology infrastructure to the hundreds of communities with school district, college and state office facilities.

This proposal will accomplish four things. First, it will help satisfy the insatiable appetite that students, faculty and government have for bandwidth to connect to their peer locations, the Internet, Internet2 and to Kentucky's growing array of rich digital materials and services. Second, it will enable hundreds of free community Wi-Fi hotspots at public libraries, community

colleges, universities and related locations. Third, the advanced infrastructure that will be paid for with these funds will make it possible for the bandwidth providers to offer broadband services to businesses and households that otherwise would have been non-profitable. This proposal is the anchor tenant that allows a large number of small businesses to share the infrastructure and everyone succeeding. Fourth it will increase the effective use of available bandwidth through targeted professional development and awareness efforts.

Project Description (General Goals & Implementation Strategies):

The first goal of this proposal is to be a part of the larger goal of providing ubiquitous broadband access everywhere, to everyone in Kentucky. Specifically this proposal would address the education, government and non-profit communities. The second goal is to help create environment for productivity, collaboration and resource sharing. Just as the Internet is making the world a closer knit community, a robust network connecting Kentuckians will do the same. Lastly is the goal of supporting bold new applications. Higher bandwidths will enable leading edge research and advancing UK toward its top 20 goal. Accelerate the trend toward cloud computing that will scale the necessary computing power but will require more bandwidth. Carry remote back-ups and enable disaster recovery hot spots in the event one or more locations are hit with a natural disaster. Deliver rich video content that engages students, interactive video for virtual field trips and effective administrative meetings. The proposals from the six other writing teams will likely consume a good deal of bandwidth. The other concept papers cover the areas of eHealth, NASA, Energy and Sustainability, STEM, College Readiness and Homeland Security.

This proposal will provide awareness by educators about incorporating and sharing resources, utilizing the available content, and integrating resources within K-20 classrooms; exploration of digital databases, remote access to instrumentation like UofL's Southern Skies, virtual environments and visualizations, and the rapid transfer of huge exchanges of data; access for educators to government agencies (NASA, NOAA, Kentucky History Center, etc), museums (Smithsonian, Mote Marine Laboratory, the Exploratorium, Muhammad Ali), and special projects (The Digital Corinth Project, The Global Classroom from the United States Holocaust Museum, BIG BLUE); remote backups with the rapid exchange of large quantities of data.

This is not a "build it and they will come" proposal. A key component is for Professional Development that would include a multi-year selection of distinguished and forward thinking educators to create a K-20 User Group. These distinguished fellows would collaborate to champion the use of the advanced network. In addition this group would work to develop Kentucky based collaborative K-20 programs and initiatives. These K-20 projects would focus on Work Force Development and Science, Technology, Math and Engineering partnerships to benefit universities, community and technical schools, and middle and high schools. This group could create collaborations as tools for creating bridges between K-12 and college enrollment and retention.

It is envisioned that there will be three tiers of connectivity. First, fiber connections for all of the four-year public institutions and some of the major community colleges and independent universities. Second, MPLS connections to all other community colleges and independent

colleges and universities and all school districts. Finally, point to point connections from all the remaining locations to the nearest host with a fiber or MPLS connection for aggregation.

The cost structure would change the way we currently pay for bandwidth and adopt the KyRON fiber model for all bandwidth. The KyRON model calls for the purchase of dark fiber where available or a long term IRU with the fiber owner. This fits the distribution of the Stimulus money which is one-time funding. It is anticipated that the lower ongoing cost could be funded from current recurring revenues.

Project Team (Project Manager(s), Content Experts, Instructional Designers, etc.):

KyRON, University of Kentucky, University of Louisville, CPE, COT, Windstream, AT&T, KCTCS, AIKCU, Kentucky universities and colleges, KDLA, Education Cabinet

Project Budget & Amount of Economic Stimulus Funds Requested:

Equipment	\$15.0m	
Fiber Runs	\$12.0m	
Design Consultants	\$0.5m	
Implementation Support	\$1.4m	
MPLS connections	\$25.0m	
Point to Point Connections	\$4.0m	
Professional Development and Awareness	\$1.8m	
20 % match	\$12.0m	
TOTAL	\$71.7M	